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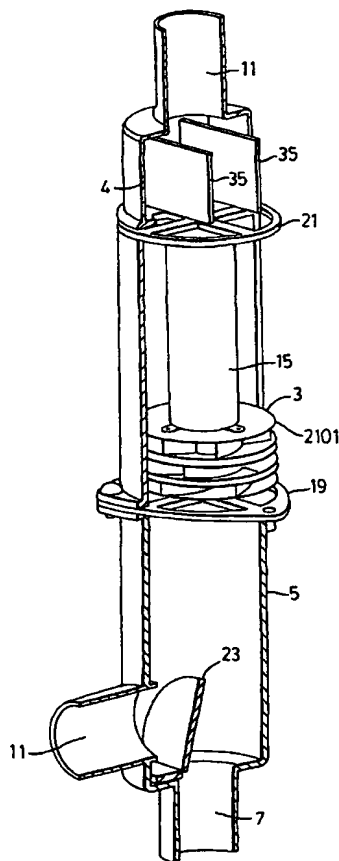
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(54) Title: **SUCTION MOTOR FOR VACUUM CLEANER**



(57) Abstract: A cleaner (1) has a DC brushless motor (15) with stator (203) and rotor (212). Stator is mounted on a shaft and rotor is mounted inside and to a tubular body (207) about stator (203). Impeller (17) is mounted to and outside tubular body (207). The motor (15) and impeller (17) are mounted in a housing having an intake (17) and an exhaust (9). Operation of the motor and rotation of the impeller causes a partial vacuum at the intake (7) to draw air. The air is exhausted through the exhaust (9). A filter (61) prevents particles from entering the motor (15). Particles are collected in a receptacle (5) prior to the filter (61). The impeller (17) may be a squirrel cage fan, bladed fan, or centrifugal fan. A secondary exhaust (11) expels particles from the filter (61) and/or receptacle (5) by rotation of the impeller (17) in an opposite direction or by the use of a secondary DC motor and impeller. The housing (2) can fit in a cavity between conventional wall studs.

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 European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 56606 A (SEB SA ET AL) 11 November 1999 (1999-11-11) abstract figures	1
A	WO 97 37423 A (AEG HAUSGERAETE GMBH ET AL) 9 October 1997 (1997-10-09) page 21, line 4 - line 11 page 22, line 6 - line 13 figure 13	1
A	US 3 676 986 A (REILING J W) 18 July 1972 (1972-07-18) abstract figures	12
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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 6 323 570 B1 (NISHIMURA HIROSHI ET AL) 27 November 2001 (2001-11-27) abstract column 4, line 23 - line 32 figure 5 -----</p>	1

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9956606	A	11-11-1999	FR 2778327 A1 AU 3713499 A EP 0994668 A1 WO 9956606 A1 JP 2002509475 T	12-11-1999 23-11-1999 26-04-2000 11-11-1999 26-03-2002
WO 9737423	A	09-10-1997	WO 9737423 A2 EP 0888663 A2	09-10-1997 07-01-1999
US 3676986	A	18-07-1972	NONE	
US 6323570	B1	27-11-2001	US 6400048 B1 US 2002079761 A1 AU 754001 B2 AU 2356399 A CN 1235808 A EP 1297773 A1 EP 1293158 A1 EP 0947155 A2 JP 11313786 A	04-06-2002 27-06-2002 31-10-2002 14-10-1999 24-11-1999 02-04-2003 19-03-2003 06-10-1999 16-11-1999

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